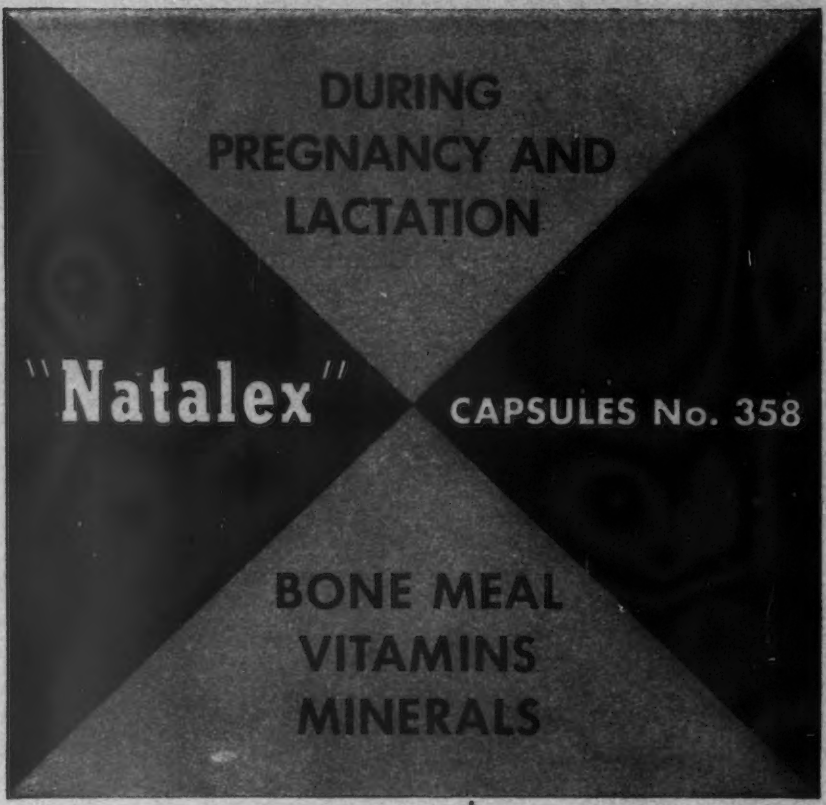
Canadian Journal of PUBLIC HEALTH

Volume 44 FEBRUARY 1953 Number 2

Published Monthly by the
CANADIAN PUBLIC HEALTH ASSOCIATION
150 COLLEGE STREET, TORONTO 5



THIS NEW PREPARATION provides the essential food factors so necessary for the pregnant and lactating woman and so often lacking in her regular diet. It will also be found useful during convalescence and in iron deficiency anemia when vitamin therapy is indicated.

Each capsule contains:

Bone meal (purified)	(5 gr.) 323 mg.
Ferrous Sulfate B.P.	(5 gr.) 323 mg.
Vitamin A	1000 I.U.
Vitamin D	500 I.U.
Thiamine	1 mg.
Riboflavin	1 mg.
Niacinamide	5 mg.
Ascorbic Acid	25 mg.
Sodium Iodide	1/300 gr.

In bottles of 100 and 500

The suggested dosage is one capsule 3 times daily.

AYERST, McKENNA & HARRISON LIMITED
Biological and Pharmaceutical Chemists • MONTREAL, CANADA

799

University of Toronto

SCHOOL OF HYGIENE

Diploma in Public Health

THE Diploma in Public Health is the recognized qualification for physicians serving in public health. It was established by legislation in 1888 in Great Britain. In Canada, the first course was given in the Faculty of Medicine, University of Toronto, in 1912 and since 1914 the course has been provided each year. In the United States, the first postgraduate course in public health for physicians was provided at Harvard University in 1914. Approximately 300 physicians have received the Diploma in Public Health from the University of Toronto since 1940.

The course provides a comprehensive introduction to public health. Its purpose is to equip physicians to plan and direct public-health programmes, both rural and urban, as medical officers of health.

The course extends over an academic session of eight months. Experience in public health is one of the requirements, and for those who have not had this, three months of field training is arranged.

Postgraduate fellowships are granted, through the Provincial Departments of Health, to physicians who are planning careers in public health. Postgraduate training includes the fields of mental health, maternal and child hygiene, epidemiology, industrial hygiene and related subjects. Fellowships provide travel expenses, tuition fees, an allowance for books, and a stipend of $200 a month for single physicians and $250 a month for married physicians during the period of the course.

The Royal College of Physicians and Surgeons of Canada provides a specialist's certificate in public health following five years of preparation. The course leading to the Diploma in Public Health constitutes an essential part of the requirements for certification.

For further information concerning the Diploma in Public Health, write The Director, School of Hygiene, University of Toronto, Toronto 5, Ontario.

Canadian Journal of
PUBLIC HEALTH

VOL. 44 FEBRUARY, 1953 NO. 2

CONTENTS

ARTICLES:

EDITORIAL SECTION:

DEPARTMENTS:

The Canadian Journal of Public Health is published monthly by the Canadian Public Health Association. Editorial and business offices, 150 College Street, Toronto 5, Ontario. Subscription $3.00 a year, payable in advance. Single copies 50 cents. Authorized as second-class mail, Post Office Department, Ottawa.

Canadian Journal of
PUBLIC HEALTH

VOLUME 44 TORONTO, FEBRUARY 1953 NUMBER 2

Hospitalization among Residents of Urban and Rural Communities

G. W. MYERS, C.A.
Executive Director
Saskatchewan Hospital Services Plan
Regina, Saskatchewan

DO RESIDENTS of rural areas, small urban centres, and cities receive approximately the same amount of general hospital care, or are there considerable differences among these types of communities in hospitalization experience? Other studies have indicated that in large areas of this continent the volume of hospital care supplied to residents of rural communities and small towns and villages is proportionately much smaller than that obtained by people who live in cities. These studies have suggested that this is not primarily due to variations in the incidence of illness, but instead occurs mainly because of differences among populations of these communities in financial resources with which to pay for needed hospital care.[1] One of the major factors cited as affecting the question of financial resources is the concentration of a large proportion of insurance coverage for hospital bills among the urban population.[2]

Whether this or some other pattern of hospital care would exist if all persons were provided with hospital-care insurance may perhaps be indicated to some extent by examination of experience in Saskatchewan where a government hospital-care insurance scheme known as the Saskatchewan Hospital Services Plan has covered most of the population of the province for over five years. Certain statistical data relating to the Plan's 1951 operations are submitted in this paper for the purpose of studying urban and rural patterns of hospitalization.

Presented before the Vital and Health Statistics Section at the fortieth annual meeting of the Canadian Public Health Association, held in the Fort Garry Hotel, Winnipeg, June 16–18, 1952, in conjunction with the first meeting of the Manitoba Public Health Association.

Nature of Sample

The covered population of the Plan in 1951 averaged 779,470, or nearly 94 per cent of the total population of Saskatchewan as recorded in the census of that year.* This figure is based upon a tabulation of beneficiaries recorded up to August 31, 1951.

Beneficiaries of the Plan include all persons who have resided in the province for over six months, who are not already provided with hospital care under federal or other provincial programs, and for whom the necessary amount of hospitalization tax has been paid. Recipients of provincial or municipal social assistance are included in the covered population of the Plan as a result of tax payment by provincial or municipal governments. Categories excluded from the operations of the Plan as a result of hospital care being provided in other programs include patients in mental hospitals and tuberculosis sanatoria, members of the armed forces and Royal Canadian Mounted Police, War Veterans' Allowance recipients, treaty Indians, prisoners in federal penitentiaries and most inmates of provincial gaols. Residents of the sparsely settled far northern part of the province known as the Northern Saskatchewan Administration District are not required to participate in the Plan but may become beneficiaries upon voluntary payment of the hospitalization tax.

The 1951 covered population is estimated to represent more than 97 per cent of the maximum number who could become beneficiaries if the hospitalization tax were paid on behalf of everyone eligible to participate in the Plan.

Beneficiaries of the Plan reside in the 8 cities, 89 towns, 386 villages and 300 rural municipalities of the province and in unorganized territory. All cities are of medium or small size, ranging from Regina with a population of 71,319 to Yorkton with 7,074.[3] Towns have a population of at least 500 when incorporated, but in a few cases subsequently drop below this level; the average covered population per town in 1951 was 920. Villages averaged 219 beneficiaries, ranging from less than 100 people up to more than the minimum size required for incorporation as a town. There is thus a slight overlap in size between towns and villages. Rural municipalities and unorganized territory contained 54.6 per cent of all beneficiaries in 1951, with the remainder living in cities, towns and villages. A distribution of cities, towns, villages and rural areas according to size of covered population appears in Table I.

On behalf of beneficiaries who are hospitalized in Saskatchewan institutions, the Plan makes payment for most services required during in-patient care. These include public ward or minimal accommodation (including meals, special diets and general nursing care), use of operating and case rooms, surgical dressings and casts, x-ray and other diagnostic procedures including laboratory tests, x-ray treatments, anaesthetic drugs and equipment, physiotherapy and most drugs in general use. No limit is placed on the number of days of care for which payment is made by the Plan for care received in Saskchewan hospitals, as long as there is medical necessity for in-patient care. About 92 per cent of all patient days in public general hospitals of Saskatchewan are covered by the Plan.

*The population according to the Census of Canada, 1951, was 831,728.

Payment for care in hospitals outside Saskatchewan is limited to 60 days per annum at a maximum daily rate of $5 for adults and children and $1 for newborns, with the exception of paraplegics, to whom the 60-day limit does not apply, and of cases hospitalized at Flin Flon or The Pas, Manitoba, for whom payment is made in respect of the same services as are covered in Saskatchewan hospitals.

TABLE I

DISTRIBUTION OF NUMBER OF URBAN MUNICIPALITIES AND RURAL AREAS ACCORDING TO SIZE OF COVERED POPULATION, 1951

Covered Population	*Total*	*Urban Municipalities*				*Rural Areas**
		All Urban Municipalities	*Cities*	*Towns*	*Villages*	
Total	806	483	8	89	386	323
0– 499	416	402		30	372	14
500– 999	155	45		31	14	110
1,000– 1,999	172	21		21		151
2,000– 2,999	49	4		4		45
3,000– 3,999	4	2		2		2
4,000– 4,999	2	1		1		1
5,000– 9,999	4	4	4			
10,000–19,999	1	1	1			
20,000 +	3	3	3			

*Includes 300 rural municipalities and territory not yet organized into municipalities, consisting of 21 local improvement districts, Prince Albert National Park and Northern Saskatchewan Administration District.

Items excluded from the schedule of benefits are out-patients services, the extra cost of private and semi-private accommodation, services of doctors or special nurses who are not employed by the hospital, blood for transfusions, patent medicines, hospitalization for arthritis or rheumatism in institutions associated with mineral springs or spas, and a few drugs. Cases which are covered by Workmen's Compensation legislation are also excluded from the operations of the Plan.

While the exclusion of certain segments of the population and certain types of cases precludes the Plan's experience providing a complete record of all phases of hospitalization among residents of Saskatchewan, the fact that its beneficiaries comprise nearly 94 per cent of the provincial population and that it covers most in-patient accounts incurred in public general hospitals of the province makes it possible to derive a substantial amount of information from the operations of the Plan respecting urban and rural patterns of hospital care.

Pattern of Hospital Care

The volume of hospital care received during 1951 by beneficiaries residing in cities, towns, villages and rural areas is summarized in Table II. It will be observed that only 21.4 per cent of patients discharged were city residents, although cities contain 24 per cent of the covered population, while rural areas accounted for 54.2 per cent of discharged cases and 54.6 per cent of total beneficiaries. Towns and villages, on the other hand, both recorded a somewhat greater share of hospital cases than of covered population. The distribu-

tion of days of care was somewhat different in that rural residents received 49.5 per cent of the total, a figure considerably lower than the proportion of rural people among beneficiaries of the Plan, while all three classes of urban municipalities experienced a percentage of hospital days higher than that recorded for their proportion of covered population.

TABLE II

COVERED POPULATION AND HOSPITAL CARE, EXCLUDING NEWBORNS, ACCORDING TO RESIDENCE, 1951

Residence	*Covered Population*		*Discharged Hospital Cases*		*Days of Care**	
	Number	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*
All areas	779,470	100.0	154,848	100.0	1,715,232	100.0
Cities	187,539	24.0	33,115	21.4	442,000	25.8
Towns	81,901	10.5	18,229	11.8	204,886	11.9
Villages	84,607	10.9	19,613	12.6	219,126	12.8
Rural Areas	425,423	54.6	83,891	54.2	849,220	49.5

*Based on discharged cases only and therefore include some days of care provided in prior years to cases discharged in 1951.

The distribution of discharged hospital cases and days of care among residents of cities, towns, villages and rural areas is examined according to length of stay in hospital in Table III. The principal point displayed in this table is that cities experience a greater proportion of long-stay cases than do towns, villages or rural areas. Patients staying more than sixty days, for example, represented 2.4 per cent of all cases and 26.1 per cent of patient days, pro-

TABLE III

HOSPITAL CARE, EXCLUDING NEWBORNS, BY LENGTH OF STAY, 1951

Length of Stay in Days	*All Areas*		*Cities*		*Towns*		*Villages*		*Rural Areas*	
	Cases	*Days**	*Cases*	*Days**	*Cases*	*Days**	*Cases*	*Days**	*Cases*	*Days**
	Number of Cases or Days									
Total	154,848	1,715,232	33,115	442,000	18,229	204,886	19,613	219,126	83,891	849,220
1–10	112,378	574,073	22,366	117,684	13,417	67,913	14,134	71,139	62,461	317,337
11–20	26,701	381,144	6,382	92,695	2,967	42,519	3,386	48,183	13,966	197,747
21–30	7,510	186,582	2,001	49,689	818	20,364	978	24,418	3,713	92,111
31–60	5,790	241,762	1,583	66,759	708	29,534	805	33,542	2,694	111,927
61+	2,469	331,671	783	115,173	319	44,556	310	41,844	1,057	130,098
	Percentage Distribution									
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1–10	72.7	33.5	67.5	26.5	73.6	33.1	72.1	32.3	74.5	37.4
11–20	17.2	22.2	19.3	21.1	16.3	20.8	17.2	22.1	16.6	23.3
21–30	4.8	10.9	6.0	11.2	4.5	9.9	5.0	11.2	4.4	10.8
31–60	3.7	14.1	4.8	15.1	3.9	14.4	4.1	15.3	3.2	13.2
61+	1.6	19.3	2.4	26.1	1.7	21.8	1.6	19.1	1.3	15.3

*Based on discharged cases only and therefore include some days of care provided in prior years to cases discharged in 1951.

portions considerably higher than in other types of communities. The smallest proportion of cases over sixty days was recorded for residents of rural areas. When cases of over sixty days are excluded, the proportion of cases staying 31–60 days was also higher in cities than in other communities.

Data considered so far have dealt with the volume of hospital care without allowance for the varying age and sex distribution of the population in the four types of communities. An allowance for this factor is included in hospitalization rates which are presented in Tables IV and V. The age-sex-adjusted rates in these tables have been computed by the "direct method",[4] using total 1951 beneficiaries of the Plan as a standard population.

TABLE IV
HOSPITALIZATION RATES AND AVERAGE LENGTH OF STAY, 1951

Residence	*Discharged Cases per 1,000 of Covered Population*		*Days of Care per 1,000 of Covered Population*		*Average Days of Stay*	
	Crude	*Age-sex adjusted*	*Crude*	*Age-sex adjusted*	*Crude*	*Age-sex adjusted*
All Areas	199	—	2,201	—	11.1	—
Cities	177	170	2,357	2,253	13.3	13.3
Towns	223	211	2,502	2,193	11.2	10.4
Villages	232	221	2,590	2,276	11.2	10.3
Rural Areas	197	206	1,996	2,156	10.1	10.5

As seen in Table IV, discharged hospital cases, at adjusted rates, totalled 170 per 1,000 beneficiaries in cities, 211 in towns, 221 in villages and 206 in rural areas. Crude rates were 177 discharged cases per 1,000 for cities, 223 cases for towns, 232 cases for villages and 197 cases for rural areas. All of the differences between these rates are more than twice the standard error of the differences and therefore indicate significant variations between urban and rural communities in the volume of hospital cases.[5]

Deliveries, complications of pregnancy, childbirth and the puerperium constituted the largest single cause of admission to hospital in 1951 among residents of both urban and rural communities (see Table V). The number of cases ranged from 29 per 1,000 in cities to 39 per 1,000 in rural areas. The large variation in hospitalization rates for this diagnostic category accounts for a large part of the differences between total rates of urban and rural communities. It appears to be a direct result of the fact that fertility rates are highest in rural areas and tend to decrease in urban centres. The Plan's experience in 1951 showed that for every 1,000 female beneficiaries between the ages of 15 and 44, cities recorded 103 births in hospital, towns 110 births, villages 104 births and rural areas 128 births (see Table VI).

Except in cities, the second most frequent cause of hospitalization was the classification accidents, poisonings and violence. In cities this cause ranked third with an adjusted rate of 13 cases per 1,000 beneficiaries as compared to 16 cases in towns, 18 cases in villages and 17 in rural areas. The low rate recorded in cities is probably due mainly to the fact that Workmen's Compensation coverage affects a larger proportion of people in cities and that therefore

TABLE V

Hospitalization Rates and Average Length of Stay by Diagnosis and Residence, 1951

List Nos.*	Primary Diagnosis	All Areas	Cities		Towns		Villages		Rural Areas	
			Crude Rate	Age-Sex Adjusted Rate	Crude Rate	Age-Sex Adjusted Rate	Crude Rate	Age-Sex Adjusted Rate	Crude Rate	Age-Sex Adjusted Rate
		Discharged Cases per 1,000 of Covered Population								
	All Causes	199	177	170	223	211	232	221	197	206
C43	Deliveries, Complications of Pregnancy, Childbirth and the Puerperium	35	35	29	32	31	34	36	36	39
C50	Accidents, Poisonings, and Violence	16	13	13	17	16	18	18	17	17
C29	Acute Pharyngitis and Tonsillitis, and Hypertrophy of tonsils and adenoids	16	16	18	16	18	17	18	15	15
C31	Pneumonia	9	8	8	11	11	11	11	9	9
C42	Diseases of Genital Organs	8	8	7	10	9	10	9	8	8
C36	Appendicitis	8	6	7	9	9	8	9	8	8
C30	Influenza	7	3	3	11	11	11	10	8	8
C46	Arthritis and Rheumatism, except Rheumatic Fever	4	3	3	5	5	6	5	5	5
C39	Diseases of Gallbladder and Bile Ducts	4	3	3	5	5	5	5	4	5
C25	Arteriosclerotic and Degenerative Heart Disease	4	4	4	7	5	6	4	4	4
C12	Malignant Neoplasms, Including Neoplasms of Lymphatic and Haematopoietic Tissues	4	5	4	5	4	6	4	4	4
	All Others	84	73	71	95	87	100	92	79	84
		Days of Care per 1,000 of Covered Population								
	All Causes	2,201	2,357	2,253	2,502	2,193	2,590	2,276	1,996	2,159
C43	Deliveries, Complications of Pregnancy, Childbirth and the Puerperium	276	263	224	249	240	274	287	287	311
C50	Accidents, Poisonings, and Violence	176	196	188	193	171	199	173	160	169
C29	Acute Pharyngitis and Tonsillitis, and Hypertrophy of tonsils and adenoids	50	49	54	47	50	53	55	50	48
C31	Pneumonia	93	94	93	109	99	107	97	87	92
C42	Diseases of Genital Organs	98	108	101	116	99	113	97	88	98
C36	Appendicitis	72	60	61	76	78	73	77	76	75
C30	Influenza	49	27	26	72	66	74	66	50	53
C46	Arthritis and Rheumatism, except Rheumatic Fever	80	69	65	112	87	100	79	75	85
C39	Diseases of Gallbladder and Bile Ducts	55	55	49	62	53	64	55	52	59
C25	Arteriosclerotic and Degenerative Heart Disease	96	122	116	125	96	144	106	69	84
C12	Malignant Neoplasms, Including Neoplasms of Lymphatic and Haematopoietic Tissues	122	162	155	139	110	154	119	94	109
	All Others	1,034	1,152	1,121	1,202	1,044	1,235	1,065	908	976
		Average Days of Stay in Hospital								
	All Causes	11.1	13.3	13.3	11.2	10.4	11.2	10.3	10.1	10.5
C43	Deliveries, Complications of Pregnancy, Childbirth and the Puerperium	7.9	7.5	7.7	7.8	7.7	8.1	8.0	8.0	8.0
C50	Accidents, Poisonings, and Violence	11.0	15.1	14.5	11.4	10.7	11.1	9.6	9.4	9.9
C29	Acute Pharyngitis and Tonsillitis, and Hypertrophy of tonsils and adenoids	3.1	3.1	3.0	2.9	2.8	3.1	3.1	3.3	3.2
C31	Pneumonia	10.3	11.8	11.6	9.9	9.0	9.7	8.8	9.7	10.2
C42	Diseases of Genital Organs	12.3	13.5	14.4	11.6	11.0	11.3	10.8	11.0	12.3
C36	Appendicitis	9.0	10.0	8.7	8.4	8.7	9.1	8.6	9.5	9.4
C30	Influenza	7.0	9.0	8.7	6.5	6.0	6.7	6.6	6.3	6.6
C46	Arthritis and Rheumatism, except Rheumatic Fever	20.0	23.0	21.7	22.4	17.4	16.7	15.8	15.0	17.0
C39	Diseases of Gallbladder and Bile Ducts	13.8	18.3	16.3	12.4	10.6	12.8	11.0	13.0	11.8
C25	Arteriosclerotic and Degenerative Heart Disease	24.0	30.5	29.0	17.9	19.2	24.0	26.5	17.3	21.0
C12	Malignant Neoplasms, Including Neoplasms of Lymphatic and Haematopoietic Tissues	30.5	32.4	38.8	27.8	27.5	25.7	29.8	23.5	27.3
	All Others	12.3	15.8	15.8	12.7	12.0	12.4	11.6	11.5	11.6

*Classified according to "International Statistical Classification of Diseases, Injuries, and Causes of Death, 1948," Vol. 1, 363-365.

a higher percentage of hospitalized accident cases in cities would be excluded from coverage by the Plan.

Acute pharyngitis and tonsillitis, and hypertrophy of tonsils and adenoids accounted for 18 cases of hospitalized illness per 1,000 beneficiaries in cities, towns and villages and for 15 cases per 1,000 in rural areas (adjusted rates). Crude rates for tonsillectomies and adenoidectomies performed on beneficiaries of the Plan also indicate a lower incidence in rural areas, being 14.7 operations per 1,000 persons in cities, 13.3 operations per 1,000 in towns, 12.4 in villages and 12.3 in rural areas. More frequent inspection of children in urban schools by school nurses, with resulting attention to nose and throat conditions, may be a factor in higher hospitalization rates for this purpose in urban communities. It is also not unlikely that there is actually a greater incidence of nose and throat infections in urban centres resulting from larger schools and the operation of numerous theatres and other places of public entertainment where the presence of large crowds facilitates the spread of such diseases.

TABLE VI

LIVE BIRTHS IN HOSPITAL COVERED BY SHSP, 1951

Residence	*Female Beneficiaries Aged 15–44*	*Live Births in Hospital Covered by SHSP*	
		Number	*Rate per 1,000*
All Areas	169,028	19,729*	117
Cities	47,756	4,916	103
Towns	18,439	2,033	110
Villages	17,380	1,812	104
Rural Areas	85,453	10,968	128

*Represents 94 per cent of live births in hospitals and 91 per cent of total live births in Saskatchewan.

The lowest rates for both pneumonia and influenza were recorded in cities, while towns and villages experienced rates higher than both cities and rural areas. When considered together, these two causes of admission to hospital accounted for 11 cases per 1,000 in cities, 22 cases in towns, 21 in villages and 17 in rural areas. The low rate in cities may be associated with the fact that city residents, on the average, live only a short distance from doctors and hospitals and are thus more likely to receive home care for the early treatment of minor respiratory ailments which otherwise might develop into more serious pulmonary diseases. It may not be practicable to care for such patients who reside outside of cities except through hospitalization if they have journeyed several miles from their homes in the country or in another town during severe weather in order to see a doctor.

That this geographic factor—proximity of patient, doctor and hospital—operates in the same way in a large proportion of cases would seem to be borne out by the fact that the average length of stay in hospital is greatest among city residents for eight out of the eleven diagnostic categories shown in Table V. In other words, the greater possibilities for home care in cities may result frequently in only the more serious cases being admitted to hospital,

with a consequently smaller number of cases per 1,000 persons and a longer average length of stay.

Average days of stay for all causes of admission (adjusted rates) were 13.3 in cities, 10.4 in towns, 10.3 in villages and 10.5 in rural areas. The fact that there were variations in average length of stay in hospital operated to make differences in urban and rural days of care much less striking than differences in rates for discharged cases. Rates after adjustment for age and sex were 2,253 days per 1,000 beneficiaries in cities, 2,193 days per 1,000 in towns, 2,276 days in villages and 2,159 days in rural areas.

Summary and Conclusions

To summarize, the experience of the Saskatchewan Hospital Services Plan, a government hospital care insurance scheme which covers well over 90 per cent of all cases in public general hospitals of the province, indicates that there were some differences in the patterns of hospital care in urban and rural communities in 1951. People in the smaller urban centres were hospitalized more frequently than any others. Cities had the lowest rate, with rural areas somewhat below towns and villages. On the other hand, average length of stay was highest in cities, and slightly higher in rural areas than in the smaller urban centres, with the result that variations in total days of care were not particularly striking.

These differences in patterns of hospital care are associated with varying fertility rates and possibly with certain geographic and environmental factors. There is no evidence that any of the four types of communities in Saskatchewan receives a greater or smaller volume of hospital care as a result of any other factors. In other words, there is no indication of marked differences in the amount of hospital care received by residents in urban and rural areas of Saskatchewan such as have been attributed to economic factors in other parts of the North American continent.

REFERENCES

1. Mott, F. C., and Roemer, M. I.: Rural Health and Medical Care. New York: McGraw-Hill Book Company, Inc., 1948, pp. 217–244.
2. Ibid., p. 437.
3. Census of Canada, 1951.
4. Hill, A. Bradford: Principles of Medical Statistics. London: The Lancet Ltd., 1950, pp. 207–215.
5. Ibid., p. 111.

Vital Statistics in a Local Health Program

MATTHEW DANTOW, B.S., M.B., D.P.H.
Medical Health Officer
Saskatoon, Saskatchewan

HEALTH ADMINISTRATORS owe a great deal to those pioneers of the modern public health era, William Farr, John Simon, Lemuel Shattuck, and others who emphasized the relation of vital data to conditions of health and disease, setting down principles for future guidance in evaluating health programs. Through their study and training, health officers are aware of many ways in which birth and death registrations may be employed in their departmental activities, but they are frequently uncertain where to place their emphasis. These administrators may often have felt somewhat disheartened by the thought that they are not doing as good a job as they would like to do, despite their special training. Such self-criticism is, in my opinion, an excellent thing.

Making Vital Statistics Available to the Local Health Officer

The methods by which the information contained in birth and death registrations is obtained by health departments vary across the Dominion. In some areas registrations go directly from the local registrars to the Provincial Division of Vital Statistics, the local health department being by-passed in the initial instance. After a varying interval of time the health department may receive, either routinely or upon request, the number of births and deaths registered, with possibly some commentary. In other areas the original registrations are passed to the health department for abstraction of certain particulars and then forwarded as mentioned above. In a third type of case the division registrar may be a member of the health department, e.g. the medical health officer.

The "Report of the Study Committee on Public Health Practice in Canada", published in June, 1950, states: "In approximately 50% of the agencies visited the health department had no active part in the collection, compilation or transmission of the vital statistics." And again: "In only nine of all the health agencies visited was an endeavour being made to utilize vital statistics in the planning of the future program of the community."[1]

Local Differences in the Handling of Vital Statistics

Local health jurisdictions differ in size and complexity. At one extreme we have the larger cities such as Montreal, Toronto and Vancouver, while at the other we have the rural health units. In between we have varying gradations as urban-rural health units and small or medium-sized cities. Basically the functions of all health departments are the same, relating to supervision of sanitation, communicable disease control, and other activities; but within these

Presented before the Vital and Health Statistics Section at the fortieth annual meeting of the Canadian Public Health Association, held in the Fort Garry Hotel, Winnipeg, June 16–18, 1952, in conjunction with the first meeting of the Manitoba Public Health Association.

limits of similarity, the organization and implementation of programs differ markedly.

In different parts of the Dominion local health units have a variety of problems and have developed a diversity of procedures for dealing with them. There are also local variations in such additional factors as shortage of personnel and lack of funds. To set down a rigid pattern for a health officer to follow in the use of vital statistics is unlikely to result in their being used most advantageously.

The procedure followed in Saskatoon is not described with the thought that it would have universal application. Rather it is hoped that some aspects of our experience may be of value to local health officers who face similar problems.

Procedure in Saskatoon

The medical health officer is registrar of vital statistics for the City of Saskatoon, which has a population of 53,000. This appointment dates back to January 1, 1935, when an Order-in-Council was passed providing for such delegation of authority upon the request of the municipality.

With respect to birth registrations, it may be stated, for practical purposes at any rate, that all legitimate births occur in the city hospitals. *Birth registrations are usually received in our office from these institutions within one week of the event.* The important particulars are taken down by one of our stenographers. Vital-statistics work occupies 40% of the time of one stenographer and 20% of another.

These items include the baby's name and address, date of birth, attending physician, father's name and occupation, etc. This information is placed in a master book of the loose-leaf type, which when not in use is kept under lock and key so that unauthorized persons may not gain access to it. After this has been done, the original registrations are forwarded to the Provincial Division of Vital Statistics.

Employing the above information, our nurses then send out two cards to the new mothers. On one, which is white in color, best wishes are extended to the mother and child, inviting them to attend one of our permanent well-baby clinics; the second card is blue in color, and titled "Good Insurance". It invites the mother to bring her baby to the health department to see its work and she is reminded that she is paying through taxes for the service which it renders. The remainder of this card emphasizes the importance of primary and reinforcing immunizations. On both cards hours and days are listed for convenience and guidance.

These cards are printed on good paper and are easy to read. They are signed by the medical health officer. We feel that this is a practical gesture which helps ensure a good relationship with the city's new parents, and accordingly, support for the health-department program. Such a procedure is possible only because we receive the registrations directly.

Value to Local Health Department of Early Receipt of Birth Registrations

It is believed by many that a health department's function is predominantly educational. It has been emphasized by various authorities that the earlier the educational message is given and its lessons translated into action, the

better will be the results in improved personal and public health. In Saskatoon, although we do not have a full-time health educator, each staff member is impressed with his responsibility for public health education.

Because we receive the birth registrations directly and quickly, an early home visit is possible. By gaining an early entry to the home, the nurse advises the mother regarding a variety of matters at a time when this is most helpful. This assistance deals with the care and development of the new baby, emphasizes hygienic requirements, breast feeding and an adequate intake of vitamins, etc. In this way the nurse helps the mother interpret and implement the family physician's instructions. She may also assist with health problems of other members of the family, e.g., emotional or behaviour problems of pre-school or school children, chronic invalidism, or any type of welfare situation requiring solution.

As Smillie has pointed out, "Public health and public welfare have become so closely inter-related that we have no exact criteria as to just where a public health function ends and a welfare function begins."[2] Our nurse may be unable to handle a problem herself but she will know to whom referral should be made, e.g., the Department of Social Welfare, the Red Cross, Family Welfare, etc. The nurse will tell the mother about the well-baby and immunization clinics, and repeat the invitation mentioned above. The need of continuous health supervision is stressed, and rather than supplanting the family physician we feel that we are complementing his efforts.

The health officer sees all birth registrations, checks them for completeness and accuracy, and signs them before they are sent to the Provincial Department. Thus he is enabled to determine birth rates periodically, and he may compare these with health jurisdictions in other areas. Scrutiny of the birth registrations gives him a great deal of miscellaneous information regarding social and other population characteristics of his municipality, which is difficult to evaluate in words.

Death Registrations Channelled Through Local M.H.O. to Province

Death registrations when received are studied in a similar manner, and these too are checked for completeness and accuracy. Relevant information is abstracted and tabulated. Occasionally a communicable disease is given as the primary cause of death. In these cases our communicable-disease file is checked. If the disease mentioned was not reported, e.g., tuberculous meningitis or peritonitis, bacillary dysentery, etc., we get in touch with the certifying physician and request a formal notification. Steps are immediately taken for epidemiological investigation as indicated—tuberculin testing of contacts in our office and arrangements for x-ray at the sanatorium, stool examination of dysentery contacts, etc. Other procedures are invoked where necessary with as little delay as possible. These important control measures would not be as efficient under another system of mortality registration.

Channelling these registrations through the local health department assists the Provincial Vital Statistics Division by helping ensure that registrations are properly completed. I would emphasize particularly the medical certificate of cause of death. Because of pressure of professional duties a physician may fail to complete this properly; he may use terms not recommended in the International Classification, or the train of events which led up to the fatal termina-

tion may not be tabulated in the correct sequence. The physician is interviewed and the necessary corrections made. Incidentally, the physician gains by this exchange of ideas. Occasionally a physician may certify a cause of death where he did not attend the individual during life. We advise him that the local coroner must be informed under the Vital Statistics Act, and we check with the coroner to ensure that this has been done.

In our department we classify the primary cause of death as each registration is received and processed. We employ the "Intermediate List of 150 Causes for Tabulation of Morbidity and Mortality" of the "Sixth Revision of the International Lists of Diseases and Causes of Death". This has been done as a matter of convenience and as a practical measure because we wish to include the chief causes of death in our monthly report. The Provincial Division of Vital Statistics forwards to us, periodically, a list of the coded causes of death for our municipality, but all these lists are not received in time for inclusion in the monthly report. However, when it is shown at the provincial level that we have erred in coding, we incorporate such corrections in our annual statistical summaries and analyses.

The system whereby birth and death registrations are channelled through the local health department seems superior to any other. Certainly in a city the size of Saskatoon, there seems very little room for argument. The health officer gains an insight into population characteristics which would be difficult to obtain in any other way. The number of births and deaths, the natural increase, and the rates associated with these vital happenings, as well as other pertinent information, may be determined with the least waste of time. Through study of these registrations, the medical health officer gains valuable assistance in planning and evaluating his program.

Timely Local Statistics are "News"

One often hears criticism leveled at health officers for presenting long lists of boring statistics which have only an anaesthetic effect. The presentation of such facts in this manner may be tedious for his audience, but if the health officer distributes these in reasonably small doses, with perhaps brief relevant comments, they will be well received. At any rate, that has been our experience. Comparisons with other communities are welcomed by the reading and listening public, especially in small urban centres of rural areas. However, care should be taken to indicate the significance of all rates mentioned, and the limitations of crude rates may be noted. We have found that the press and radio are most anxious to use this type of material.

Vital-statistics information presented in the annual reports of Provincial and Dominion Government Departments necessarily reaches us too late to come within the category of 'news'. They are often three to four years out of date. In this modern world, where time is of the essence, health officers must make every effort to give the public reliable information regarding vital events with as little delay as possible.

REFERENCES

1. Canadian Public Health Association: Report of the Study Committee on Public Health Practice, 1950, p. 23.
2. Smillie, W. G.: Public Health Administration in the United States. New York and Toronto: The Macmillan Company, 1949, p. 416.

What Can a Health Program Do to Improve Tommy's Dental Health?

A. B. SUTHERLAND, D.D.S., D.D.P.H.
Dental Officer
Department of Public Health
Sudbury, Ontario

CONSIDERATION is being given to Tommy's dental health rather than that of his older sister or his grandfather, not to minimize the dental problem posed by his elders, but to emphasize it. The pre-natal and post-natal period of his existence probably exert a greater influence on his future dental status than is presently understood. At the moment, however, without hope of controlling the gene factor, we accept the nutritionist's and the paediatrician's prescription for normal gestation and infant life as being adequate also for normal dental development.

The chief menace to Tommy's oral health is tooth decay. In discussing what a health program may do to improve Tommy's dental health, I speak from the level of my own employment, the community level. Community health standards are raised by co-ordinated effort; any facet of a health program which cannot be fitted into a co-operative effort will fail. A dental program can be so adapted. I shall not outline the specific contributions which various staff members may make to the dental aspect of a health program. The onus for gaining co-operation falls upon the dental officer, granted that the co-ordinating head—the medical officer of health—has a real conviction of the significance of dental health.

In discussing a plan or program for solving the problem which originates with Tommy, I shall draw attention to some of the obstacles which lie in the way of implementing it. I repeat that we recognize dental caries as the major problem.

It is possible to make reasonable calculations of the rate at which caries attack teeth from the earliest age. From an average of about one affected tooth surface per child 3 years of age, the rate increases (by actual count of 597 six-year-olds in my community this year) to 11.1 decayed, missing (prematurely) or filled, deciduous tooth surfaces per child at age six. For present purposes we may regard this increase from 1 to 11.1 attacked surfaces as a yearly arithmetic average increase of 2.8 surfaces. The program to meet child needs is the one that will utilize all available means to reduce this annual increment by preventing the occurrence of decay and by providing dental

Part of a symposium, "Making Child Care Work", presented before the Sections of Public Health Nursing, Public Health Nutrition, and Public Health Dentistry at the fortieth annual meeting of the Canadian Public Health Association, held in Winnipeg June 16–18, 1952.

treatment when decay does occur—within reasonable intervals, four to six months, or even a year.

By what means may the incidence of caries be reduced? The Canadian Dental Association, in a published monograph entitled "Prevention in a Dental Health Program", expresses the view that prevention depends upon research, education, and dental care. One is in accord with this. It is true that educational material stems from research, from experience in fact-finding. What of the material being presently used in dental health education? A review of current literature will reveal that a very great deal of the information being provided for children, parents, teachers and the public concerning how tooth decay may be avoided is based upon the concept of fermentable carbohydrates as the cause. Nor is this concept new. The early Greeks hinted at it. In 1746 Pierre Fauchard,[2] whom we regard as the father of modern dentistry, stated: "Confections, dragees and all sugars contribute in no slight measure to the destruction of teeth; because of their glutinous nature they penetrate the gums and adhere; and there is in sugar a penetrating acid which corrodes them, as chemical analysis shows; it causes trouble sooner or later." About 150 years later a distinguished dental scientist, Willoughby D. Miller, in his book "Micro-organisms of the Human Mouth", added refinements to this concept. Since that time research based upon this hypothesis has been pursued. The most recent educational aid which I have received through official dental channels begins as follows: "Although the cause of tooth decay is not definitely known, one widely held theory considers tooth decay the result of acids produced in the mouth by bacterial action on carbohydrates." Statements like this and similar ones so commonly made, probably indicate more than anything else a need for even further research. In any case, they are not of a nature to motivate parent or child to eschew sugar. If we are to educate Tommy in the use of a tooth brush for other than a cosmetic purpose, i.e. to remove the carbohydrate substrate, we must be in a position to make more positive statements.

It is our great good fortune that, although lacking positive knowledge of the cause of tooth decay, we are yet able to take evasive action.

From controlled experiments involving a greater number of human beings than ever before subjected to scientific test, we have proof of the efficiency of a procedure which may be undertaken for reduction of the caries incidence. I can speak of this with a good deal of satisfaction since the measure has been adopted in my community. As fluoridation is proving to be a matter of considerable controversy, I offer, for what it is worth to anyone contemplating such a project, a brief account of how the project was undertaken in Sudbury.

On November 12, 1951, our Dental Society met with the Board of Health. The chief of the Dental Division in the Department of National Health and Welfare was invited to attend the meeting, as was the Director of Dental Services for the Province of Ontario. The subject of their joint presentation of the results of the Brantford fluoridation experiment has since been published in the Journal of the Canadian Dental Association.[3] Before this meeting closed, the Dental Society passed (unanimously) a recommendation that the Board

of Health should ask Council to undertake fluoridation forthwith. The Board of Health, in turn, recommended to Council that they take immediate action to provide fluoridation. Consideration was given the matter by the City Council, with the result that the Waterworks Department was authorized to proceed with the project. As the matter came before the various civic committees, they frequently called upon the medical officer of health for information and advice. Having made previous reference to the influence which a medical officer of health's views may have upon a dental program, I cite this as a case in point to illustrate it. Today, just over six months following the initial action taken by the dentist, equipment for fluoridation is being installed. Our daily newspaper lent editorial support to the project, and while not a great deal of publicity was offered, what was released through press and radio was based on the anticipated saving in the cost of dental care. It was also stated that fluoridation did not constitute a panacea for dental caries.

Until a satisfactory method for fluoridating individual household water supplies is devised, only those dwelling in larger communities with communal water supplies (over 50% of the Canadian population) may benefit. Despite this present limitation, fluoridation is a ranking public health development of recent years and is particularly striking since it is applicable in a field where control measures have been relatively ineffective.

Whereas today three-year-old Tommy suffers one carious tooth surface, we anticipate that his counterpart of three years hence will have .4 or .5 of one surface: that whereas today's six-year-old displays 11.1 affected surfaces, in his counterpart there will be found 4.5 to 5.5 defects. The yearly increment between three and six years will not be the current 2.8, but will be from 1 to 1.4. Benefit to the permanent teeth will be comparable. (I should note that I have omitted any mention of how important it is that Tommy's primary teeth be kept in normal function up to shedding time, since this is taken as understood.)

Regardless of whether Tommy is or is not permitted the benefits of fluoridation, his problem—which, I repeat, is the crux of the adult one—can be met only as he receives reparative-restorative dental care on the basis of need, incident to early, regular and frequent attention. Even a reduced incidence, if left unattended, will build to a devastating and unmanageable prevalence. The following statement from the medical officer of health[4] with whom I am associated is of interest:

"Admitting that there actually is a dental problem, and I am convinced that there is, there are certain parallels that appear as compared with other public health problems. In nutrition it was found that different agencies preached different sermons, all heading to the same end but, in that they contradicted each other, a state of glorious confusion prevailed until all agencies agreed on basic principles and agreed to stick to these principles.

"Let us do away with qualified statements. We are convinced that refined sugars are partially, at least, responsible for dental caries.

"Education in itself, while essential to all public health projects, has never been the complete answer to any problem. In venereal disease control, the

first approach was by education and an appeal to the morals, but results were negligible until treatment facilities and diagnostic facilities were provided.

"Similarly in tuberculosis control, until treatment and diagnostic facilities were made available, there was no marked decrease in the death rate from tuberculosis.

"Until treatment facilities are made available to all our children, no improvement will be evident in our children's dental health."

In agreement with the foregoing is the statement by Ira W. Hiscock, as Professor of Public Health, Yale University, regarding treatment facilities for patients suffering from tuberculosis: "If community resources or opinion will not provide for an agency competent to do these things and permitted to do them, then health education will become as sounding brass and tinkling cymbals."

We have been at pains to indicate that the only rational approach to the problem under discussion is through the child, whose real difficulties commence at age three and who must be afforded continuing care from this age. We believe that it is a prime function of public health to educate parent and guardian—in other words, the public—to see that such care is provided.

Present Facilities

What of present facilities? In Canada today, with a population of almost 14 million, there are just over five thousand dentists. Among these, ten follow the specialty of pedodontics. Thirty-seven are engaged full-time, sixty-eight half time, in school dental service. In my community, as in many others, we have no pedodontists and no school dental service. Nor do we seek the latter, but rather a preschool service. When we deduct from the total number of Canadian dentists some two hundred who are engaged in teaching, public health, etc., it becomes clear that Canadian children are dependent upon the private dentist for the care which we consider to be essential. In my community the ratio of dentists to population is similar to that for all of Canada, 1/2,740. On paper, Tommy is included in these 2,740 persons, but does he share equally with his elders in the service rendered by each dentist? Unfortunately, the answer is no. From a study[5] made during June 1950, we found that children of the ages 3, 4 and 5 years who collectively represented 6.6% of the population of Sudbury, received just 1.7% of that month's total of all dentists' practice hours. This percentage may have since improved, but in any case I submit that the ratio figure, 1 to 2,740, as applied to our city or to the whole of Canada, is nowhere near a true representation of the personnel available to meet what we have described as a vital need.

One is certain that nowhere is there to be found a group of dentists more co-operative or of higher professional integrity than those with whom I am associated in my work. Numbered among them are some who tell me in all honesty that were it possible for the children under six years of age in the community to receive dental care in some place other than their surgery, they would welcome it. I have reason to believe that this attitude is not one peculiar only to dentistry as practised in our city.

Through four annual assessments of the dental state of some 7,000 primary

school children, and our efforts to bring about improvement, we have demonstrated that parents can be motivated to seek dental attention for their children. By way of illustration, the figures from one school this year show that only 19.46% of the need for fillings had been met among the six-year-olds in their first year at school (there was no kindergarten). Among the seven-year-olds in the second grade, 41.84% of required restorations were present. Similar, though less remarkable, improvement between first- and second-year pupils has been noted in this school since the beginning of our program. This improvement is attributable to the co-operation of nurse, teacher, and parents, and the parents' ability to meet the cost of treatment. The above percentage figures of need fulfilled are not false ones developed through the expediency of removing carious though otherwise repairable teeth. Speaking generally, and not of this one school, the rate of tooth loss is found to be inversely related to the percentage of the need for restorative work (fillings) which has been met. In comparing the extent to which the need for restorative treatment has been fulfilled in one school as against another, we find that it is correlated to socio-economic status. We have not observed any correlation between caries attack rate and socio-economic status.

In the school referred to above, a 100% improvement in the fulfilment of treatment requirements was evident between first- and second-year pupils, but six-year-old beginners in this school had an average of 9.8 decayed, missing (prematurely), or filled deciduous tooth surfaces. They had suffered premature loss of first teeth at the rate of 143 per 100 children. Influence has been brought to bear and motivation effected, but not before an economic problem, a dental problem, has developed; children are needlessly lacking teeth, are needlessly suffering oral sepsis.

Without doubt, the preschool age presents the most auspicious opportunity for rendering dental care, which is understood to mean treatment, with advice and instruction. This is the age when lasting habits are formed. Of greatest significance is the fact that when care is rendered a child this age, he or she is invariably accompanied by a responsible adult who at no other time will be equally receptive to advice given concerning the child's dental welfare.

The views expressed, like the facts presented, come from a four-year period of experience and appraisal of a situation. It is out of this that we are now moved to seek for our program the support necessary to provide for our three-, four- and five-year-olds an integrated "dental treatment–education–care" program as a supplement to that now available but considered to be inadequate.

SUMMARY

Dental health is a public health problem in which dental caries is the most important factor.

The rational approach is through the child.

Fluoridation offers a measure of partial control.

Treatment must complement education.

Educational material must be factual, forthright and forceful.

We have in Canada a dental problem the extent of which, in terms of cost and personnel to deal with it, is unknown. Until personnel are available and

committed to deal with an incidence rather than offer futile struggle against a prevalence, it will so remain.

A public health problem is recognized, but it is recognized also that public health does not have recourse to adequate facilities for meeting it.

It is sought to demonstrate that, through the provision of adequate pre-school care, lasting improvement can be made in the dental health of the adult population.

REFERENCES

1. Dixon, T. P.: Personal communication.
2. Fauchard, Pierre: The Surgeon Dentist. Lindsay translation, p. 24.
3. Brown, H. K.: Mass Control of Dental Caries by Fluoridation of a Public Water Supply. J.C.D.A., 1952, *18*:200.
4. Cook, J. B.: Personal communication.
5. Sutherland, A. B.: A Study of the Fulfilment of Essential Dental Needs in a Community. J.C.D.A., 1951, *17*: 256.

The Phenomenon of Treponemal Agglutination for the Serodiagnosis of Syphilis

A PRELIMINARY REPORT

ROBERT M. CAIN, Lt.(j.g.), M.S.C., U.S.N.R.
Naval Preventive Medicine Unit Number 4
Great Lakes, Illinois

ALTHOUGH the phenomenon of treponemal agglutination is not new, its use as a diagnostic aid has been limited because of the number of false positive reactions encountered. Culture spirochaetes have been used, but these organisms produced agglutination in both normal and syphilitic serum. The degree of agglutination was higher in the latter, but not sufficiently higher to be of significance.[1, 2] Even with tissue-culture spirochaetes, agglutination was found in normal as well as syphilitic serum.[3, 6] However, during the development of the Treponema Pallidum Immobilisation Test by Nelson[4] it was observed that treponemes taken from early syphilomas from x-irradiated rabbits produced no spontaneous agglutination, in contradistinction to treponemes from non-irradiated animals which produced spontaneous agglutination. It was on the basis of this observation that the phenomenon of treponemal agglutination as a diagnostic aid was re-studied, using the Treponema Pallidum Immobilisation Test as the basis for comparison.

Rabbits weighing from 4 to 7 kilograms were given a total dosage of 600 Roentgen units (300 R to each side). Twenty-four to forty-eight hours after irradiation, the animals were infected with the Nichols strain of *Treponema pallidum* by injecting 0.5 ml of the treponemal suspension intratesticularly.[5] At the same time, a non-irradiated rabbit was infected in the same manner, as a control. At the development of orchitis in the test animals, the irradiated rabbits were sacrificed and, using sterile technique, the testicles were removed. The testicles were then sliced into about six to ten thin slices with a common end and placed in basal medium[4] for extraction. Extraction was accomplished by gentle shaking in a water bath at 35°C. for two hours, or by gentle shaking at 2–4°C. for 12–18 hours. At times, several extractions of live treponemes were possible from the same set of testicles.

After extraction, the live treponemes were heat-killed in a water bath at 56°C. for thirty minutes. This was followed by centrifugation at 1500 r.p.m. for ten minutes, to remove gross testicular material from the treponeme suspension. Finally, an approximation of numbers of organisms per high dry

Accepted for publication December 4, 1952.
This work was done at the Naval Medical Research Institute, Bethesda, Maryland. The opinions expressed are those of the author and do not constitute an endorsement by the Medical Department of the U.S. Navy.

field was made, under darkground illumination, and the antigen suspension was stored at 2–4°C. in sterile cotton-stoppered tubes covered with rubber caps.

An antigen considered valid for this preliminary experimental work was one that would not produce treponemal agglutination when mixed in equal portions (0.5 ml) with either normal human serum or physiological saline while being shaken at the rate of approximately 200 two-inch strokes per minute at a temperature of 37°C. for 24 hours. The antigen suspension selected was one that contained approximately twenty-five treponemes per high dry field and did not produce agglutination in either normal human serum or physiological saline under the above conditions. This number of 25TP/hdf was the average number of organisms found by observing ten fields (darkground illumination) in each of two drops of antigen suspension. Counting during the testing of human sera was based on the observation of twenty-five fields at two different times, in the case of serum that produced no signs of agglutination. In sera that produced agglutination, it was found unnecessary to observe the full twenty-five fields during the first observation before clumping was observed, and the second observation was discontinued.

To determine if the agglutination phenomenon warranted further investigation, it was decided to test human sera to see if there was reasonable agreement between the agglutination results and the Treponema Pallidum Immobilisation results obtained on the same sera. Three groups of human sera were tested.

Group One contained thirty-eight sera from patients who gave no history of syphilis or of treatment for the disease. However, these patients had histories of positive serologies of other types. Twenty sera were positive to the Immobilisation test and showed evidence of agglutination, eighteen giving typical clumps at four hours, one giving loose bundles of treponemes, and one showing no agglutination at the same time. The latter two sera gave typical clumps when read at sixteen hours. The eighteen sera that gave negative Immobilisation results showed no evidence of agglutination at four, sixteen, or twenty-four hours. Due to breakage, two of these negative sera were not read at the twenty-four hour period.

Group Two consisted of eighteen sera from patients with histories similar to those of group one. These sera were all positive to the Immobilisation test and all produced positive agglutination results in four hours. One serum gave loose bundles at the four-hour reading, but at the twenty-four hour reading, typical clumps of treponemes were observed.

Group Three: This group of sera was from patients who gave vague or incomplete histories. Eleven were positive to the Immobilisation test and showed evidence of agglutination at four hours' incubation with shaking. Six were negative to the Immobilisation test and failed to produce agglutination after twenty-four hours of incubation and shaking.

With results such as these, it was felt that the agglutination phenomenon was worth further investigation. It was decided that the time element should be narrowed, if possible. Using four sera from syphilitic rabbits, three-fold dilutions were made and when mixed with the antigen suspension resulted in final dilutions of 1/10, 1/30, 1/90, 1/270, and 1/810. These mixtures were in-

cubated and shaken as previously described. Readings were taken at two, four, six, and eight hours. By counting the number of clumps observed in twenty-five fields, it was found that in all except two cases the maximum number of clumps was observed at the four-hour reading (see Table I).

TABLE I

NUMBER OF CLUMPS

Serum No. 278					Serum No. 273				
Time	*2h*	*4h*	*6h*	*8h*	*Time*	*2h*	*4h*	*6h*	*8h*
Dil. 1/10	4	8	11	5	Dil. 1/10	19	7	6	5
1/30	16	18	13	8	1/30	13	7	5	2
1/90	11	14	6	3	1/90	17	13	11	7
1/270	1	7	6	3	1/270	3	21	6	4
1/810	0	3	2	2	1/810	0	3	1	1

Serum No. 256					Serum No. 282				
Time	*2h*	*4h*	*6h*	*8h*	*Time*	*2h*	*4h*	*6h*	*8h*
Dil. 1/10	1	7	6	6	Dil. 1/10	10	11	5	5
1/30	8	9	6	4	1/30	8	13	7	3
1/90	2	3	3	2	1/90	4	11	9	4
1/270	1	3	1	0	1/270	6	8	6	5
1/810	0	0	0	0	1/810	0	9	3	4

One exception to this was serum no. 273. This gave the maximum number of clumps at two hours, which may be an indication that the antigen suspension was in a zone of antibody excess. The other exception to the general trend was serum no. 278, which gave maximum numbers of clumps at six hours in the first dilution but followed the general trend in the other four dilutions. In all cases except these two, there was a decrease in the number of clumps and an increase in clump size at the six- and eight-hour readings.

Clump configuration consisted of three types:

Type One: This type was a loose bundle of treponemes found in weakly positive sera or in high dilutions of strongly positive sera. This type of clump was accompanied by a background field that revealed several unagglutinated treponemes.

Type Two: This type was by far the most frequently noted and consisted of oval-shaped masses of treponemes with clear centers. At times several of these ovals would be superimposed on one another or attached in such a manner as to give the appearance of a clover leaf. This type was generally accompanied by a background field that revealed relatively few unagglutinated treponemes.

Type Three: This type consisted of compact, round or oval clusters of treponemes with ragged edges. There were no clear centers, and the clumps were very large in comparison with types one and two. This type of clump

was accompanied by a background field that revealed relatively rare unagglutinated treponemes.

It is felt that the shapes of the agglutinated masses described were due to the shaking during incubation and were in no way related to the morphology of the organisms.

Discussion

Unfortunately, at this point of determining the critical reading time the experiment had to be terminated. One last experiment was done on a group of sera with positive serologies but negative Immobilisation results, to give an indication, if possible, of what effect diseases might have on the agglutination phenomenon. In all thirty-five sera tested, the agglutination results were negative. These sera were analysed on the basis of diseases, immunisations, etc., that the donor had had during the six months before submitting the specimen for the Immobilisation Test.

10 sera were from patients with immunisation to tetanus.
15 sera were from patients with immunisation to typhoid.
6 sera were from patients with immunisation to typhus.
14 sera were from patients with immunisation to cow-pox vaccine.
5 sera were from patients with immunisation to cholera.
2 sera were from patients with immunisation to Japanese B encephalitis.
3 sera were from patients with unclassified upper respiratory diseases.
2 sera were from patients reporting gonorrhoea.
1 serum each was from patients reporting the following: measles, mumps, chancroid, herpes zoster, infectious hepatitis, malaria, and rheumatic fever.
10 sera were from patients who gave no histories of disease, immunisation, or of symptoms or treatment of syphilis.

Eight sera from patients reporting treatment for syphilis gave both positive agglutination and positive Immobilisation results. Two sera from treated patients gave negative results to both tests. Two sera from the same patient (taken four months apart) gave doubtful Immobilisation results, the first giving positive agglutination results in four hours and the second giving negative agglutination results at the same time.

One serum from a treated patient gave a negative Immobilisation result, but gave weak agglutination at four hours, manifested by loose bundles of treponemes. A repeat test was performed and the same results were obtained. No critical significance is attached to this difference in results since it is not known when either the agglutinating or immobilising antibody disappears during the course of treatment.

Finally, one serum with negative immobilising results gave a weakly positive agglutination result at four hours. A repeat test yielded the same results. This serum was taken from a patient who submitted an incomplete history of symptoms and/or treatment for syphilis and gave no indication of illness during the six months before submission of the specimen. This serum, therefore, is the only one tested to date where an inexplicable variance between the immobilisation and agglutination tests exists.

Many questions remain unanswered and further work along these lines is felt to be justified. For example:

1. Which antibody, the agglutinating or immobilising, appears first during the course of response to infection?
2. Which of the antibodies disappear first during the course of treatment?
3. Would surface adsorption of some material to the antigen possibly remove the agglutination test from the realm of microscopics and make the results visible to the naked eye?
4. What is the durability of antigen suspensions prepared in basal medium? (The suspension used in this work was found to be valid after 64 days' storage at 2–4°C.)
5. What are the possibilities of using more simple extraction media? (Others have reported using saline extractions, and this was attempted during the series of experiments described, but results were insufficient and are therefore not presented.)

These are some of the problems that remain unsolved. The key to the successful application of the agglutination phenomenon as a diagnostic aid for the detection of syphilis probably lies in the fact that the antigen suspension used in this work was from an x-irradiated rabbit. It is believed that where others have attempted to use tissue-cultured spirochaetes but have not met with complete success, the failure was due to a minute amount of naturally produced antibody that was carried over on the surface of the tissue-extracted treponemes, ultimately causing agglutination in normal sera as well as syphilitic sera. However, in the experiments presented here, it was felt that the criterion for antigen acceptability was rigid enough to rule out the possibility of antibody carry-over from the test animals. If the antigen suspension failed to produce agglutination in twenty-four hours when diluted 1/2 with normal serum, it was assumed that the x-irradiation had been effective in temporarily destroying the antibody mechanisms of the animal and, consequently, the treponemes extracted were antibody-free.

It is believed that the critical reading time should be set at six hours. In most of the positive human sera tested, there was evidence of agglutination as early as four hours, but a few gave delayed agglutination. All but one of the experiments yielded agglutination at four hours, but the one exception did not develop clumping until six hours. It is for this reason, to include the rare case, that six hours is offered as the most effective time of reading the results.

Summary and Conclusions

Experimental work is presented which resulted from the study of the agglutination of *Treponema pallidum* extracted from syphilomas of x-irradiated rabbits. A total of 122 human sera were tested and the results were analysed and compared with the results obtained by the Treponema Pallidum Immobilisation Test on the same sera. Excellent agreement was found in all but a few cases; and disagreement was explicable in all but one case involving a patient with an incomplete history.

Since this work is far from complete, these data are presented without any definite conclusions being drawn. No further work by the author is possible,

but it is hoped that this information will be of assistance to others in attempting to obtain a simple and rapid method for the diagnosis of syphilis.

ACKNOWLEDGMENT

The author wishes to express his gratitude to Lt. Robert A. Nelson, Jr., M.C., U.S.N.R., for suggesting the investigation and for sharing his laboratory facilities at the Naval Medical Research Institute in order that the work could be performed. Thanks are due also to L.Cdr. Robert F. Jaeger, M.S.C., U.S.N.R., and Lt. Frances Spear, M.S.C., U.S.N., who acted as consultants during the investigation, and to HN Robert J. Cumming, whose assistance in caring for and preparing the experimental animals was most helpful.

BIBLIOGRAPHY

1. Beck, A., J. Hyg., 1937, *38*:298.
2. Caldwell, W. Alexander, J. Exp. Path., 1930, *11*:1.
3. Kolmer, John A., Kast, Clara C., and Lynch, Elsa R., Am. J. Syph., 1942, *26*:142.
4. Nelson, Robert A., Jr., personal communication.
5. Nelson, Robert A., Jr., and Mayer, Manfred M., J. Exp. Med., 1949, *89*:369.
6. Tani, T., and Asano, C., Japanese Med. J., 1951, *4*:51.

Whooping Cough in Vancouver During 1950

S. McMASTER, M.D., D.P.H.
Director, Health Unit No. 4
Metropolitan Health Committee
Vancouver, British Columbia

DURING 1950 a mild epidemic of whooping cough occurred in Vancouver, following two years in which very few cases were reported. This provided an opportunity to enquire into the immunization history of those affected, to find out the age groups most affected and to compare, if possible, the severity and duration of the disease in the immunized and non-immunized groups.

The Connaught Medical Research Laboratories Triple Vaccine, prepared from a semi-synthetic fluid medium, has been used exclusively since 1948 at the immunization clinics and child health centres. Three doses of ½, 1 and 1 c.c. are given one month apart, followed by a fourth dose of 1 c.c. three months later. Reinforcing doses of 1 c.c. are recommended at 2, 3 and 5 years of age.

No case occurred in any child who had four doses of triple vaccine. The majority of immunized children affected had received the double antigen in three doses, as given before 1948, and only a few had received a reinforcing dose. Since the epidemic last year we have made great efforts to give reinforcing doses as indicated above, and a future study should be made in order to find out whether this procedure will further reduce the incidence in the immunized children. This investigation was made during 1951. The cases reported to the quarantine department were distributed amongst the district public health nurses, who undertook to obtain the necessary information from the families concerned.

Facts to be elicited were: (1) Was the child immunized? (2) If so, what number of doses had been given, and when? (3) Was the case mild or severe, and how long did it last? (4) Were there other children in the family and what was their experience?

We also tried to pick up "missed" cases, during school examinations and at the child health centres, and it soon became evident that reporting of this disease is very incomplete. A number of families had not consulted the family doctor, because the diagnosis was obvious to them or to avoid the official quarantine period. In a number of cases, the family doctor was not sure of the diagnosis and made no report; this was especially the case when the children had received part or all of the immunization.

In all, 273 cases were reported to the quarantine department. In addition, 21 cases were found during the investigation period. During the preceding two years, 1948 and 1949, only 18 and 9 cases, respectively, had been reported. For comparison, available data for the years 1939 to 1947 were also analysed. From 1939 to 1948 the Connaught Medical Research Laboratories' double

antigen (pertussis vaccine and diphtheria toxoid) was used in Vancouver. It was given in three doses of 1 c.c., 2 c.c. (1 c.c. in each arm), and 2 c.c. Reinforcing doses of 1 c.c. once or twice before the age of six were advocated. Immunization histories were not available for previous years.

Cases reported show irregular fluctuations, with two or three years of low incidence followed by an increase. The distribution of age groups affected has remained constant during the last six years. The majority of cases occur in the pre-school and early school-age group, as was the case in the epidemics of 1947 and 1950. This is in contrast to the experience in the pre-vaccination period.

The number of cases reported between 1939 and 1950, inclusive, is shown in Table I. Data concerning age groups are available for the years from 1945 to 1950.

TABLE I

WHOOPING COUGH, VANCOUVER, 1939–1950

Year	*Population*	*Number of Births*	*Number of Cases*	*Rates/ 100,000 Pop.*	AGE GROUPS AFFECTED							
					Under One Year							
					0–3 Mos.	*4–6 Mos.*	*7–12 Mos.*	*Per Cent*	*1–5 Yrs.*	*6–14 Yrs.*	*15–19 Yrs.*	*20+ Yrs.*
1939	263,974	4,359	707	267.8								
1940	269,455	4,728	223	82.6								
1941	275,353	5,269	100	36.4								
1942	275,353	6,281	422	153.0								
1943	288,541	7,253	314	108.7								
1944	299,460	7,129	284	94.7								
1945	311,799	7,281	62	20.0	5	6	9	32.8	17	21	2	2
1946	323,850	8,788	45	13.9	1	1	2	9.0	15	26		
1947	339,350	9,917	350	103.2	5	6	16	7.7	74	245	2	2
1948	354,045	9,577	18	5.0	1	2		17.0	4	11		
1949	376,000	10,111	9	2.4	1			11.0	2	6		
1950	385,500	9,859	294	76.0	5	1	11	6.0	102	162	2	5

For the period 1945-50 the total attendance at child health centres, new admissions, and home visits to infants and pre-school children were as follows:

	Total Attendance	*New Admissions*	*Home Visits*
1945	37,185	5,359	6,098
1946	40,182	6,126	4,646
1947	35,790	6,468	7,086
1948	49,013	6,908	7,577
1949	48,322	7,206	7,882
1950	50,861	7,341	8,986

These data are presented as part of the enquiry to determine whether increased attendance and increased number of children immunized affected the incidence and age distribution. About 75% of babies born in Vancouver attend the child health centres and receive immunization there, completing the preventive treatment mostly in the first year of life. Practically 100% receive the full series. The vigorous immunization program has greatly reduced

the incidence in the infant and pre-school age group, when the disease and its sequelae are most dangerous.

In Table II the 242 cases (187 who received immunization and 55 who were not immunized) are arranged according to age group and history of immunization.

TABLE II
WHOOPING COUGH, VANCOUVER, 1950
CASES ACCORDING TO AGE GROUP AND HISTORY OF IMMUNIZATION

Age Group	*Immunized*	*Not Immunized*	*Not Traced*
0–3 months	0	0	1
4–6 months	2	0	1
7–12 months	7	5	1
1–5 years	21	41	0
6–14 years	25	93	22
15–19 years	0	2	0
20 years	0	2	0
"School age"	0	44	27
TOTALS	55	187	52

The immunization history of the 55 cases which had received pertussis vaccine is analysed in Table III.

TABLE III
WHOOPING COUGH, VANCOUVER, 1950
IMMUNIZATION HISTORY OF 55 CASES WHO RECEIVED PERTUSSIS VACCINE

	Doses of Triple or Double Antigen			
Age when Immunized	*3 Doses*	*2 Doses*	*1 Dose*	*Reinf. Dose*
1st year of life	35	1	5	1
2nd year of life	3	3	4	0
3rd year of life	0	3	0	1
4th year of life	0	0	0	1
5th year of life	0	0	1	3
TOTALS	38	7	10	6

Two-thirds of the cases received immunization in the first year of life; the majority were school children who had not received a reinforcing dose since the primary immunization. Only six children in the whole group had been given a reinforcing dose. There were only two severe cases in children who had had three doses. One occurred in a 7-month-old baby in whom the immunization had not been completed, and the other was in a five-year-old child who had not received a reinforcing dose (Table IV).

Forty-four cases were definitely reported as "non-immunized" and were not recorded by age, being designated "school age". Twenty-three others were also reported as "school children", but no immunization history could be obtained. Considering the fact that approximately 10 per cent of the whole

group (21 cases) were unreported cases found during the investigation, it can be assumed that many more cases occurred than were reported.

TABLE IV
WHOOPING COUGH, VANCOUVER, 1950
CHARACTER OF THE DISEASE

	Immunized	*Not Immunized*
Mild	23	15
Moderate	11	36
Severe	4	51
Not known	17	85
TOTALS	55	187

SUMMARY AND CONCLUSION

Of 294 cases of whooping cough occurring in Vancouver during 1950, the immunization history of 242 is known. One hundred and eighty-seven cases occurred in children who had not received the preventive treatment (63 per 100,000) and 55 occurred among those who had received either part or full treatment (14 per 100,000). This would indicate a substantial reduction in incidence among those who had received immunization.

No serious reactions were reported. The children who had been immunized and developed whooping cough experienced a milder form of the disease and its duration was shorter.

Most cases occurred between 4 and 7 years in the immunized group. The majority of these children had been immunized during the first year of life, and it would seem that immunity is fairly well maintained for several years without reinforcing doses. No case occurred in any child who had received four doses of triple vaccine, given in Vancouver since 1948. Sixty-four per cent of the immunized children had received three doses of double antigen; the remainder did not complete the series. Only 2 moderately severe cases occurred in the immunized group. In the non-immunized group there were many severe cases, and one death occurred, in a two-year-old child.

Only a few families were found in which a case developed in an immunized as well as a non-immunized child. In all cases (three), the immunized child was mildly ill, and two of the non-immunized children were quite ill.

The vast majority of cases are from non-immunized children. Best results can be expected by completing immunization in the first year of life.

Canadian Journal of Public Health

VIRAL HEPATITIS

THE TERM viral hepatitis embraces two apparently related diseases, namely, infectious hepatitis and serum jaundice. Infectious hepatitis as recognized today has been known to occur in the past amid circumstances associated with such factors as overcrowding and bad sanitation. Likewise, infectious hepatitis has been found to be prevalent in time of war and peace amid conditions of institutional living and communal feeding. The disease may occur either in sporadic or epidemic form. In tropical and subtropical countries the cases commence to appear at the end of the summer months, when good sanitation and hygienic standards become increasingly difficult to maintain. Judging from figures provided through the courtesy of the Provincial Epidemiologist, Dr. R. P. Hardman, it would seem that in the Province of Ontario cases occur throughout the year, and a high proportion of cases have been annually reported in December, January, and February from 1943 to 1952. Under the Public Health Communicable Diseases Act, Section 26, Regulation 2, infectious hepatitis is a notifiable disease. This regulation, however, is seldom observed. It is of the utmost importance that the Act should be complied with in order that the epidemiological characteristics of the disease may be studied under living conditions in Canada. The mode of spread of infectious hepatitis is still incompletely understood. Intensive research by U.S. investigators has at times incriminated contaminated water supplies as a possible vehicle of spread. In connection with the latter it is well to remember that one of the earliest descriptions of a water-borne outbreak of infectious hepatitis was published in 1931 by Roy Fraser of Mount Allison University, Sackville, N.B., in the Canadian Journal of Public Health (22, 396).

In the light of present knowledge of the disease, the apparent high incidence of cases during the winter months in the Province of Ontario is worthy of careful study.

Early accounts of the disease by Bamberger in 1855 and Virchow in 1864, suggested that the disease was caused by catarrhal inflammation and obstruction at the Ampulla of Vater. Later workers, such as Eppinger, recognized that icterus catarrhalis was a miniature form of acute yellow atrophy of the liver.

It is now well established that the disease process is centred in the liver, which is the site of diffuse morphological and inflammatory changes. Following the work of J. D. S. Cameron during 1940–1 in Palestine at the time of the Middle East Campaign, it was definitely established that jaundice could be transmitted from one individual to another by the inoculation of human blood. Subsequent studies by U.S. and U.K. investigators, including J. R. Paul, W. P. Havens, F. O. MacCallum, and others, proved that infectious hepatitis was a virus disease and further demonstrated the infectivity of human excreta. The incubation period of the disease was found to vary from 25 to 35 days. The mode of onset of illness was also observed in many thousands of cases affecting British and Allied troops. Illness frequently commenced with pronounced anorexia which was associated with malaise, fatigue, and listlessness, and at times with nausea and vomiting. Fever with bodily aches and pains was noted in a significant percentage of the cases.

After a prodromal period of 2 to 4 days icterus appeared and was often accompanied with amelioration of the fever; within a few days the gastrointestinal symptoms became less marked. The icteric phase of the illness lasted from 2 to 5 weeks in the majority of instances where recovery was uninterrupted. In rare cases severe necrosis resulted in coma and death. Happily, the mortality rate has always been low, ranging from 0.13 to 0.44 per cent.

While infectious hepatitis continued to exact a heavy toll of allied fighting manpower during the critical early days of the campaign in North Africa, attention was diverted to the occurrence of another variety of jaundice which affected U.S. service personnel. The latter had been inoculated several months previously with 17D strain yellow fever live virus vaccine in the preparation of which human serum had been employed. Similar observations relating to the onset of jaundice following the inoculation of human serum had been made earlier by Findlay and MacCallum in 1937–8. Some workers have contended that serum jaundice represents the artificial production of infectious hepatitis. In view of the marked difference in incubation period between these diseases, serum jaundice or so-called post-inoculation jaundice has been thought to represent an entity separate from infectious hepatitis. Furthermore, it was pointed out that subtle differences existed in their respective clinical pictures.

Thus the onset of serum jaundice was considered to be more insidious than infectious hepatitis, with less tendency for the development of fever. The recent claims of Stokes and his co-workers to have demonstrated that infectious hepatitis may be prevented by the prophylactic use of human gamma globulin, have strengthened the hand of those who contend that each malady is a disease *sui generis*.

Notwithstanding the observations recorded on the many thousands of cases of these diseases which have occurred over the past decade, it is still not possible to state with certainty if any degree of cross-immunity exists between them. The antigenic relationship of these two viruses is not known, neither do we know whether different antigenic strains occur of each variety.

No laboratory experimental animal has yet been found to be susceptible to either of these diseases. We have, therefore, been completely dependent upon the results of irksome and laborious tests in human volunteers carried out in

several centres in the U. S. A. for such scanty information as is available respecting the aetiological, diagnostic and prophylactic aspects of these conditions.

A host of practical questions of everyday importance may be asked and among them some awkward ones such as: Is there a carrier state in infectious hepatitis? How long does viraemia continue? How long is the virus excreted in the patient's stools? Should patients be nursed in the open wards of hospitals? Should bed pans and feeding utensils be specially disinfected? Should persons who have suffered from either of these diseases be permanently rejected as potential blood donors? Another difficult question to answer is: Why does gamma globulin protect against infectious hepatitis but not serum jaundice?

In the present incomplete state of knowledge it is impossible to surmise the number of individuals in any section of the population in whom these agents may be found. The ability of normal and healthy adults to act as carriers of serum jaundice virus has introduced a real hazard when such individuals unwittingly volunteer as blood donors. Irradiation of plasma has reduced the risk of post-plasma transfusion hepatitis, but still more effective measures are much desired.

Biopsy studies of liver tissue during the acute, subacute and pre-icteric stages of the conditions reveal that extensive changes in liver parenchyma may occur. Although the prospects of complete recovery are good in the vast majority of patients, there is, nevertheless, growing evidence that residual or permanent damage may sometimes result. Whether or not such injury to liver tissue is due to the persistence of chronic virus infection or to the effect of a severe and/or prolonged acute attack cannot yet be determined. Whatever the explanation may be, the fact remains that the differential diagnosis of chronic hepatitis may present great difficulties both to the clinician and pathologist.

The need for research into the aetiology and mode of transmission of these two diseases is obvious. Until such time as more information is available they appear to be integrally bound together, and certain common principles of treatment and prevention would seem to be equally applicable to both of them. The sanitary engineer should be aware of the fact that the appearance of infectious hepatitis in any institution or community of householders may be an indication of faulty personal hygiene or defective sanitary disposal facilities. The general method of treatment to be followed comprises adequate rest in bed and the administration of a highly nutritious, high protein, high carbohydrate diet. The patient should remain in bed until jaundice and other signs and symptoms have disappeared; he should not return to work until fully recovered, a longer period of convalescence being required in the more prolonged cases. Doctors and nurses should realize the vital importance of sterilizing all syringes and needles by autoclaving or by boiling for at least ten minutes, in order that the spread of these two diseases may be kept at a minimum. With the ever increasing use of antibiotics administered by injection, it is probable that a substantial rise in the incidence of jaundice may occur if efforts are not made to maintain high standards of sterilization techniques in hospitals, clinics, and doctors' offices. *C. E. van Rooyen and J. C. Sinclair*

NEWS

Ontario

TWO TWO-WEEK WORK CONFERENCES on maternal health services are being sponsored by the Ontario Department of Health, with organizational and other details handled by the department's Division of Public Health Nursing. The conferences, arranged for two groups of public health nursing personnel, are being held in Toronto in the building at 67 College Street formerly occupied by the Hospital for Sick Children and recently taken over by the provincial government. The first course opened on February 2 and the second on February 16. Both are under the leadership of Miss Aileen I. Hogen, B.S., M.A., teacher and lecturer from the Maternity Center Association, New York City. Miss Hogen has conducted similar programs elsewhere in Canada and in the United States.

Officials of the Department of Health believe that the work conferences will result in improvement in public health nursing services generally—home visiting, conferences and case finding; in the giving of an impetus to the organization of pre-natal classes and improvement in existing classes; and better opportunities in field practice through added interest and effort in maternity health services. Following each conference, participants will share the knowledge acquired with their agencies, colleagues, and other public health nursing personnel in neighboring municipalities. In preparation for this latter undertaking the participants will be assisted by educational and regional supervisors of the provincial department's Division of Public Health Nursing.

Before joining the Maternity Center Association staff in New York, Miss Hogen was a member of the faculty at Western Reserve University, Department of Nursing, Cleveland. She is author of the pamphlet, "Bomb Born Babies".

FOR THE FIRST TIME IN ONTARIO, a course designed to give academic and practical instruction in sanitary inspection is under way at the Ryerson Institute of Technology, Toronto. Thirty-six weeks in length, the course will prepare candidates to write the examinations of the Canadian Public Health Association for the Certificate in Sanitary Inspection (Canada). It is being supervised by the Ontario Department of Health's Division of Sanitary Engineering. The services of successful students will be available to health departments in the province.

The curriculum consists of lectures, demonstrations, laboratory practice and field work, the latter comprising half of the instructional time. The students are receiving intensive training in a wide range of public health subjects which include public health organization, administration and legislation; preventive medicine, environmental sanitation, food sanitation, and public health and civil defence—which includes first-aid. The course will give them close contact with public health work in the field, supplemented by academic training presented by persons actively engaged in public health.

A TRAINING COURSE for occupational-therapy assistants in the psychiatric field—the first of its kind in Canada—was set up at the Ontario Hospital, Kingston, early in January. The course, which is twelve weeks in length, will train girls to assist in occupational-therapy programs in Ontario Hospitals throughout the Province. The first course is confined to applicants from among personnel employed in the Hospitals.

DR. L. M. STUART has been appointed Medical Officer of Health and Director of the Kenora–Keewatin–Dryden Area Health Unit. He replaces Dr. Peter Wenger, who is now Medical Officer of Health for the Fort William and District Health Unit.

DR. C. W. MACCHARLES, D.P.H., formerly director of the Northumberland–Durham Health Unit, with headquarters at Cobourg, has been appointed medical research staff officer in the Defence Research Board. He will assist in finding out the needs of the fighting forces in medical research and will co-ordinate Canada's research work with that of the United States and the United Kingdom. He has been succeeded as director of the Northumberland–Durham Health Unit by Dr. Charlotte A. Horner, D.P.H.

New Brunswick

THE HONORABLE J. F. MCINERNEY, M.D., Minister of Health and Social Services, in an official capacity at the first public ceremony since he assumed office, attended the laying of the corner stone of the new Pathological Laboratory at the Saint John General Hospital on October 23.

THE SEMI-ANNUAL CONFERENCE of the District Medical Health Officers and the heads of divisions in the Department of

Health and Social Services was held in Fredericton in November. This was the first departmental meeting attended by the Minister of Health and Social Services since taking office in October and the first at which he had the opportunity of meeting members of the Department. Policies and problems of the Department and the general health situation in New Brunswick were discussed.

FOLLOWING THE ORGANIZATION MEETING of the New Brunswick–Prince Edward Island Branch of the Canadian Public Health Association in November, the public health nurses of the Department held their annual conference. During the three-day meeting they reviewed the various field programs.

A MENTAL HEALTH CLINIC was recently opened in Fredericton. It will provide on an out-patient basis for the diagnosis and treatment of mental disorders in children as well as adults. All prospective patients must be referred by a physician or a public health nurse. This is the third mental health clinic to be operated by the Mental Health Division; the others are located in Saint John and Moncton.

IN JANUARY the National Victorian Order of Nurses Survey Committee, set up to determine how the V.O.N. can best serve the public, held their provincial meeting at Saint John. Colonel Wilfred Bovey, Q.C., was chairman and the following members of the Department of Health and Social Services were present: the Honourable J. F. McInerney, M.D., Minister of Health and Social Services; Dr. J. A. Melanson, D.P.H., Chief Medical Officer; Dr. R. J. Dolan, Director of Hospital Services and the Cancer Control Division; and Miss Muriel Hunter, R.N., Director of Public Health Nursing Services.

DR. F. C. HAZEN, D.P.H., is now District Medical Health Officer for the sub-health district of Saint John and Charlotte Counties. Dr. Hazen replaces Dr. Carl Trask, who earlier last year resigned from the Department and assumed the position of Director of the Saint John General Hospital. Before joining the Department, Dr. Hazen was with the Leeds and Grenville Health Unit at Brockville, Ontario.

DR. EUCLIDE RIOUX, D.P.H., has been made District Medical Health Officer for the sub-health districts of Madawaska and Restigouche Counties, with headquarters at Edmunston. He replaces Dr. J. P. Richard, who has been appointed to the newly created sub-health district for Gloucester County, with headquarters at Bathurst.

DR. DAVID STEWART, Professor of Philosophy at the University of New Brunswick, has been appointed Consultant to direct the Department's alcoholic-education program. As part of this program, the Department proposes to inform the people of the Province about the nature, treatment and prevention of alcoholism.

DR. A. M. CLARKE, Assistant to the Chief Medical Officer, was recently appointed as the New Brunswick representative on the National Committee for Rehabilitation of Disabled Persons. This group acts as an advisory committee to the Federal Government.

Nova Scotia

ON JANUARY 6, 7 AND 8, a Rehabilitation Conference was held at the Nova Scotia Sanatorium under the sponsorship of the Nova Scotia Tuberculosis Association and the Department of Public Health. Those in attendance included the Director of Rehabilitation for the Province and the Supervisors of Rehabilitation from each tuberculosis institution in Nova Scotia, as well as the rehabilitation staff of the Nova Scotia Sanatorium and representatives from the Unemployment Insurance Commission, the Nova Scotia Department of Labour, the Department of Education of Acadia University, the Department of Welfare of the Province and the City of Halifax, and the Veterans' Welfare Officer from Camp Hill Hospital in Halifax.

Reports were received on all phases of the rehabilitation program in Nova Scotia. Special papers were presented on the place of sheltered workshops; Goodwill Industries Limited; basic concepts of rehabilitation; special allowances for certain tuberculous persons; the development of a national rehabilitation program; the place of occupational therapy in the rehabilitation program; and the part played by the Canadian Vocational Training Scheme in the rehabilitation of the handicapped. On January 7th Dr. C. E. A. DeWitt, president of the Nova Scotia Tuberculosis Association, was host at a luncheon at the Cornwallis Inn, at which Dr. Watson Kirkconnell, president of Acadia University, was the speaker. At the conclusion of the sessions each participant left with the feeling that much has been accomplished during the past few years and with a better understanding of the approach to the problems ahead.

ON JANUARY 8 AND 9 a Refresher Course in Tuberculosis was held at the Nova Scotia Sanatorium. Those in attendance included Divisional Medical Health Officers of the Province, the medical staffs of other tuberculosis institutions, and members of the teaching staff of Dalhousie Medical School,

all of whom contributed by means of papers and discussions. The papers presented included "Some Unresolved Problems in Tuberculosis Control", "Treatment of Rounded Tuberculous Lesions of the Lung", "The Present Status of BCG Vaccination", "Physical Therapy in the Treatment of the Tuberculous Patient", "Major Chest Surgery during Pregnancy", "Case Finding and the Changing Field Problems in Tuberculosis Control", "Results in the Treatment of Tuberculous Meningitis", "Rapid Slide Culture Method for Identifying Tubercle Bacilli and for Bacterial-Resistance Testing", "Practical Aspects of Pulmonary Function Testing", "Extrapleural Plombage with Oxidized Cellulose", "The Present Status of Extrapleural Plombage with Air or Plastic Sponge", and "Tuberculosis of the Spine Treated by Fusion and Early Ambulation". One afternoon was given over to a symposium on chemotherapy, and one evening to an informal discussion of case histories and treatment of specific cases.

Prince Edward Island

A HEALTH CENTRE for the western part of the province has been completed and was opened in Summerside early in January. Situated in a wing of the Prince County Annex, it contains offices for two nurses and a sanitary inspector, and clinic rooms for tuberculosis, venereal disease, crippled children, cancer, and immunization. It is hoped that a medical officer of health may be obtained to take charge of this health centre in the near future.

MR. ROBERT DONNELLEY, who has succeeded Mr. W. K. Sharpe as director of the Division of Sanitary Engineering, recently attended the conference of the Technical Committee on the National Plumbing Code and also the Provincial Sanitary Engineers Conference, in Ottawa. Mr. Donnelley came to Prince Edward Island in September 1952, from the Department of Public Health of Saskatchewan. Since his arrival, he has put into operation a system of restaurant inspection which should prove very beneficial to the population and to the extensive summer tourist trade.

EXTENSIVE CHANGES have been made by Mr. William Crockett, director of the Division of Vital Statistics, in the registration of births and deaths. Previously there were some 486 registrars, representing the secretary of each school district in the province. Such a large number of registrars could not be satisfactorily supervised, especially since most of them performed only a few registrations each year. The number has been reduced to 55 and changes have been made in the forms required, so that better control over registrars and undertakers may be obtained. It is hoped that this will improve considerably the registration of births and deaths in the province.

MISS HAZEL HUNTER, who has been employed with the Division of Mental Health as speech correctionist since 1950, will obtain further education in her specialty in the United States. Miss Hunter has done excellent work in the correction of speech defects and in helping children who suffer from speech difficulties as a result of deafness.

Appointments

MISS M. PEARL STIVER is now General Secretary-Treasurer of the Canadian Nurses' Association, succeeding Miss Gertrude M. Hall, who has been appointed Director of Nursing at the Calgary General Hospital. Miss Stiver had been Director of Public Health Nursing for the City of Ottawa Health Department since 1949. She is a graduate of the School of Nursing of Toronto Western Hospital. She studied public health nursing at the University of Toronto and obtained her Bachelor of Science degree from Teachers' College, Columbia University.

DR. OLIVER LEROUX, Ottawa, Assistant Director of Health Insurance Studies in the Department of National Health and Welfare, has been named by the Canadian Government to serve as a member of the executive board of the World Health Organization. Dr. Leroux has also been appointed as a special assistant to the Deputy Minister of Health, Dr. G. D. W. Cameron, regarding WHO affairs. In this capacity, which is in addition to his present duties, Dr. Leroux will give special attention to Canada's work with the World Health Organization. The executive board of WHO meets twice yearly to prepare resolutions for consideration by the General Assembly and to carry out the detailed work resulting from resolutions approved by the Assembly. Dr. Leroux is also a member of the joint committee on health policy set up by WHO to work with the United Nations International Children's Emergency Fund (UNICEF).